PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing *(day/month/year)*	25.01.2005
Applicant's or agent's file reference	**IMPORTANT NOTIFICATION**
PN0276-PCT	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/NO 03/00336	08.10.2003	09.10.2002

Applicant
AMERSHAM HEALTH AS

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
PN0276-PCT		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/NO 03/00336	08.10.2003	09.10.2002
International Patent Classification (IPC) or both national classification and IPC		
A61M39/00		
Applicant		
AMERSHAM HEALTH AS		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
20.04.2004	25.01.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Rosenblatt, T Telephone No. +49 89 2399-8732

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NO 03/00336

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-9 as originally filed

Claims, Numbers

1-15 received on 21.04.2004 with letter of 20.04.2004

Drawings, Sheets

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

   ☐ the entire international application,

   ☒ claims Nos. 10-12,15

   because:

   ☒ the said international application, or the said claims Nos. 10-12,15 relate to the following subject matter which does not require an international preliminary examination (specify):

   see separate sheet

   ☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

   ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

   ☒ no international search report has been established for the said claims Nos. 10-12,15

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

   ☐ the written form has not been furnished or does not comply with the Standard.

   ☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	2,4,8,14
	No:	Claims	1,3,5,6,7,9,13
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-9,13,14
Industrial applicability (IA)	Yes:	Claims	1-9,13,14
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The subject-matter of independent claim 10 as well as independent claim 15 relates to the treatment of the human or animal by surgery since it implicitly comprises the step of catheterisation in order to transport the dispersion from the tube to the subject. Hence, according to Rule 67.1(iv) no opinion on novelty, inventive step and industrial activity will be established for these claims and their respective dependent claims.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.1 The following documents were not cited in the international search report; copies of the documents were appended to the first written opinion:
D1 = WO-A-00/038591;
D2 = FR-A-2 249 704;
D3 = GB-A-729 618;

1.2 The following document from the international search report is cited:
D4 = WO-A-00/71189.

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 is not new in the sense of Article 33(2) PCT.

2.1 The document D1 discloses in figure 3 (the references in parentheses applying to this document):

a tube (11) with a non-circular cross-section, wherein the tube is twisted along the centerline of the tube (page 8, second last paragraph to page 9, second paragraph).

Since all features of claim 1 are anticipated by the tube known of D1, the claim's subject-matter lacks novelty.

2.2 Also the tubes known from figure 43 of document D2 and the tube of document D3 anticipate the subject-matter of claim 1.

3. Dependent claims 2-7, 13, 14 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, for the following reasons:

3.1 The additional features of claims 5, 6 and 7 are all known from D1, cf. fig.3 and second paragraph on page 9, and the additional features of claims 3 and 13 are known from D2, so that these claims do not meet the requirement for novelty.

3.2 In claims 2 and 4 slight constructional changes in the tube of claim 1 are defined which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claims 2 and 4 lack an inventive step.

3.3 The closest prior art to the subject-matter of claim 14 is represented by the apparatus of D4, from which the claimed apparatus is only distinguished by the provision of a twisted tube according to claim. It is noted that the tube in D4 is of helical wound type and has a non-circular cross-section, (see fig. 1, 7 and 10).

The distinguishing feature is described in document D2 as providing the same advantages as in the present application, see in particular page 1, lines 14 to page 3, line 17. The skilled person would therefore regard it as a normal option to include this feature in the apparatus described in document D4 in order to solve the problem posed of preventing segregation of a fluid composition to be injected.

8. The method of manufacturing defined in independent claim 8 does not appear to bear an inventive activity, since it relates only to a further well known alternative to the methods mentioned in document D1, page 9, second paragraph.

9. The method of manufacturing defined in independent claim 9 is known from D1, page 9, second paragraph.

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date *(day/month/year)*	Filing date *(day/month/year)*	Priority date *(valid claim)* *(day/month/year)*

EP-A-1269935	2.1.2003	5.6.2002	5.6.2001

The document which was also annexed to the first written opinion appears to anticipate the subject-matter of at least claims 1, 3, 4, 5, 6, 13, 14 (see figs. 2, 3, 4, 6, 9 and paragraphs 4, 20, 18, 24).

Re Item VII
Certain defects in the international application

1. Reference signs are missing in the claims contrary to the requirements of Rule 6.2(b) PCT.

2. The independent claims are not in two-part form, contrary to the requirements of Rule 6.3(b) PCT.

3. The prior art known from the documents D1 to D3 is not mentioned in the description, contrary to the requirements of Rule 5.1(a)(ii) PCT.

Re Item VIII
Certain observations on the international application

1. Independent claim 1 does not meet the requirements of the PCT, since its scope is much broader than justified by the description (Art. 6 PCT, claims must be fully supported by the description). The claims 1 to 9 relate to a tube and its manufacturing in general, whereas the whole description only relates to infusion lines. Also the apparatus according to claim 13 could be any type of apparatus contrary to what is disclosed in the description.

2. Claim 14 lacks clarity (Art. 6 PCT), since it is not apparent which particular features shall be implied by the statement "for use in administration of a gravity segregating dispersion". This does not define any specific limitation to the apparatus. Even a dialysis system which is equipped with a twisted tube would fall under the scope of this claim (cf. the document mentioned under Item VI above).

JC12 R PCT/PTC 08 APR 2005 10/530745

Claims:

1. A tube with a non-circular internal cross-section, wherein the tube is twisted along the centerline of the tube.

2. A tube as claimed in claim 1 having an internal cross-section of 2-10 mm^2.

3. A tube as claimed in claim 1 or 2 further having an external circular cross-section.

4. A tube as claimed in any of claims 1 to 3 having an oval cross-section.

5. A tube as claimed in any of claims 1 to 3 having a cross-section comprising 2-5 rounded lobes.

6. A tube as claimed in any of claims 1 to 5 twisted at a constant pitch.

7. A tube as claimed in any of claims 1 to 6 made of a material selected from Fluorplastic, Liquid-Crystal Polymer, Nylon, PEEK, Polycarbonate, Polyimide, Polypropylene, Polyurethane, PTFE, PVC, Silicone, Thermoplastic Elastomere and Polyethylene.

8. A method of manufacturing a tube as claimed in any of claims 1 to 7 by continuous extrusion by the following steps:
   i) introducing the tube material into a extruder comprising a nozzle having a configuration complying with the internal cross-section and a short section of the tube to be manufacturing,
   ii) setting the nozzle to rotate at a set speed.

9. A method of manufacturing a tube as claimed in any of claims 1 to 7 comprising modification of a preformed tube by heating and twisting.

10. A method of administering a segregating dispersion to a subject using a tube as claimed in any of claims 1 to 7.

11. A method as claimed in claim 10 wherein the dispersion is an ultrasound contrast agent comprising gas microbubbles and wherein the administration is by continuous infusion.

12. A method as claimed in claims 10 or 11 wherein the dispersion is admixed with a flushing medium prior to administration to the subject.

13. Apparatus comprising a tube as claimed in any of claims 1-7.

14. Apparatus as claimed in claim 13 for use in administration of a gravity segregating dispersion to a subject, said apparatus further comprising:
    i) a delivery device adapted to receive and deliver a dispersion,
    ii) an intravenous cannula

15. Use of a tube as claimed in any of claims 1-7 in administration of an ultrasound contrast agent by continuous infusion.